Texas Collaborative for Healthy Mothers and Babies

2021 Virtual Summit

Newborn Admission Temperature

Experiences from California PQC

Henry C. Lee, MD

Associate Professor of Pediatrics (Neonatology), Stanford University School of Medicine
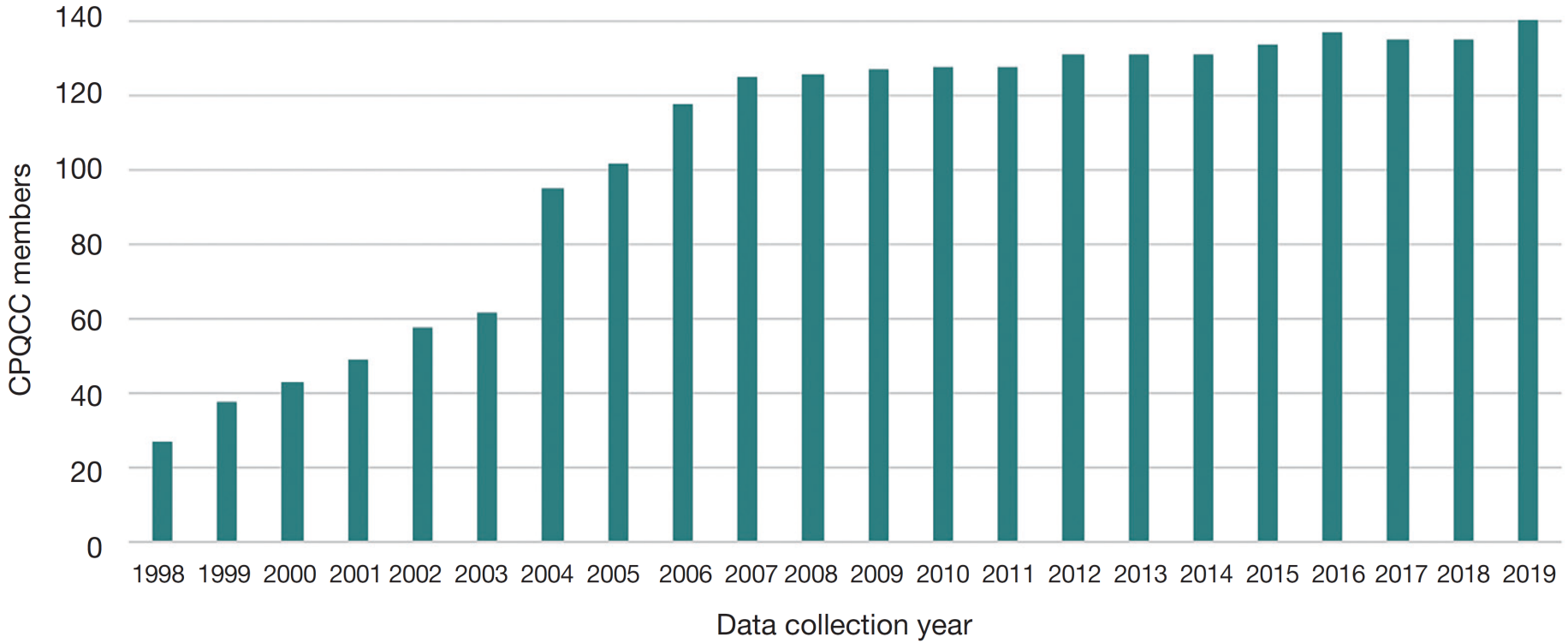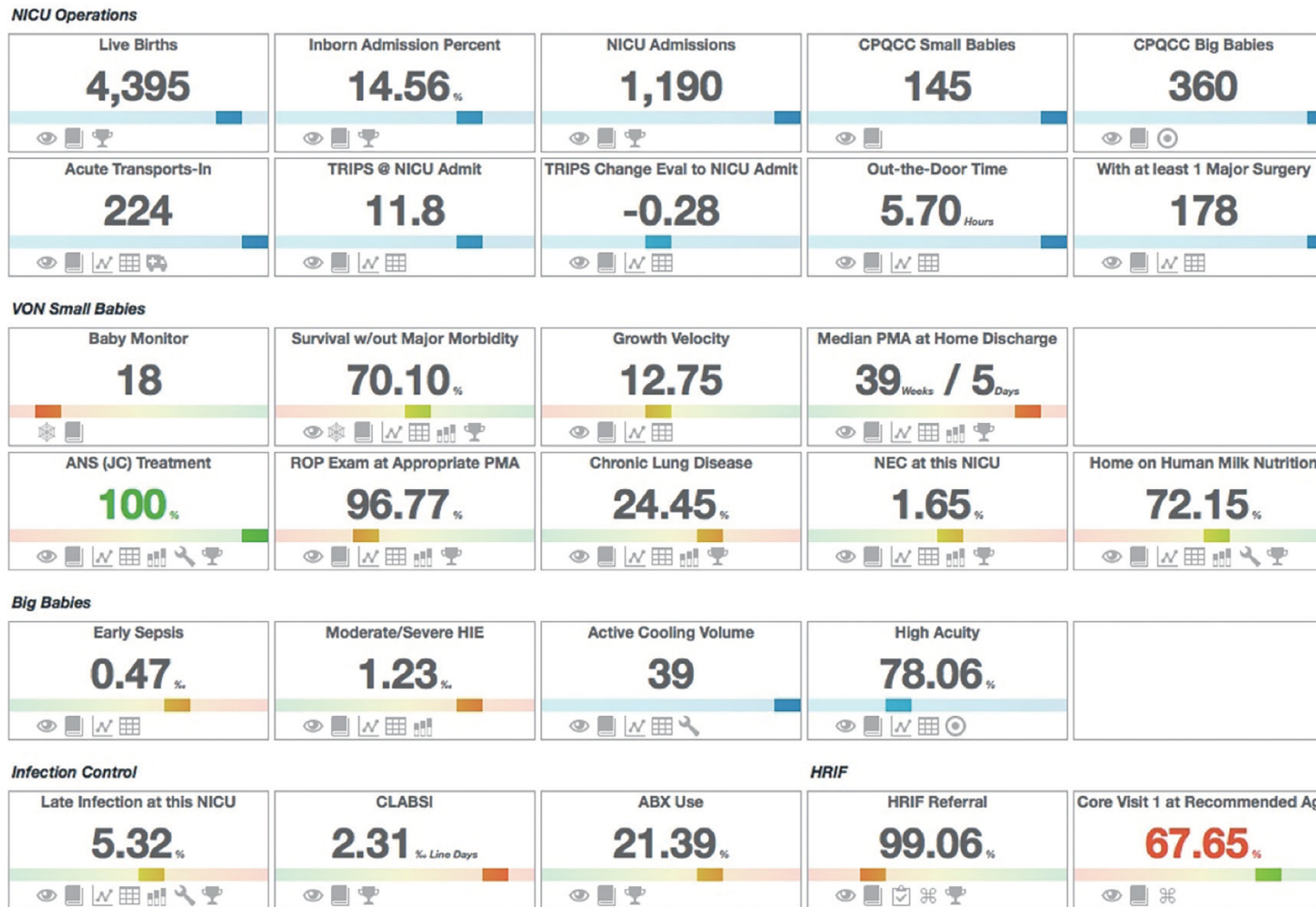
CPQCC

Figure 1 Over the course of a little more than 20 years, the CPQCC has grown to account for 17,000 NICU admissions annually across 140 member hospitals. CPQCC, California Perinatal Quality Care Collaborative; NICU, neonatal intensive care unit.

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Figure 2 An example of a quality report dashboard on the CPQCC website for a member hospital. CPQCC, California Perinatal Quality Care Collaborative.

Shih, Lee. Improving outcomes in the California Perinatal Quality Care Collaborative. Pediatric Medicine. 2019; 2:54.

Perinatal Quality Improvement Panel

Subcommittees

Data	Research	Education
Review data for opportunities for improvement.	Evaluate quality improvement activities.	Annual meeting planning
Improve quality measure reporting.	Continuous learning for future collaborative QI.	Quality improvement toolkits

2021 Improvement Palooza: Advancing Anti-Racism in the NICU Through Teamwork and Family-Centeredness

CPQCC's second annual Improvement Palooza is designed to help you understand how racism impacts NICU teams, patients, and families and identify concrete solutions to address these challenges using quality improvement principles. Held in conjunction with the California Association of Neonatologist (CAN)'s 2021 Cool Topics in Neonatology Meeting, CPQCC's 2021 Improvement Palooza is a can't miss event that will help kickstart your NICU's journey towards anti-racism.
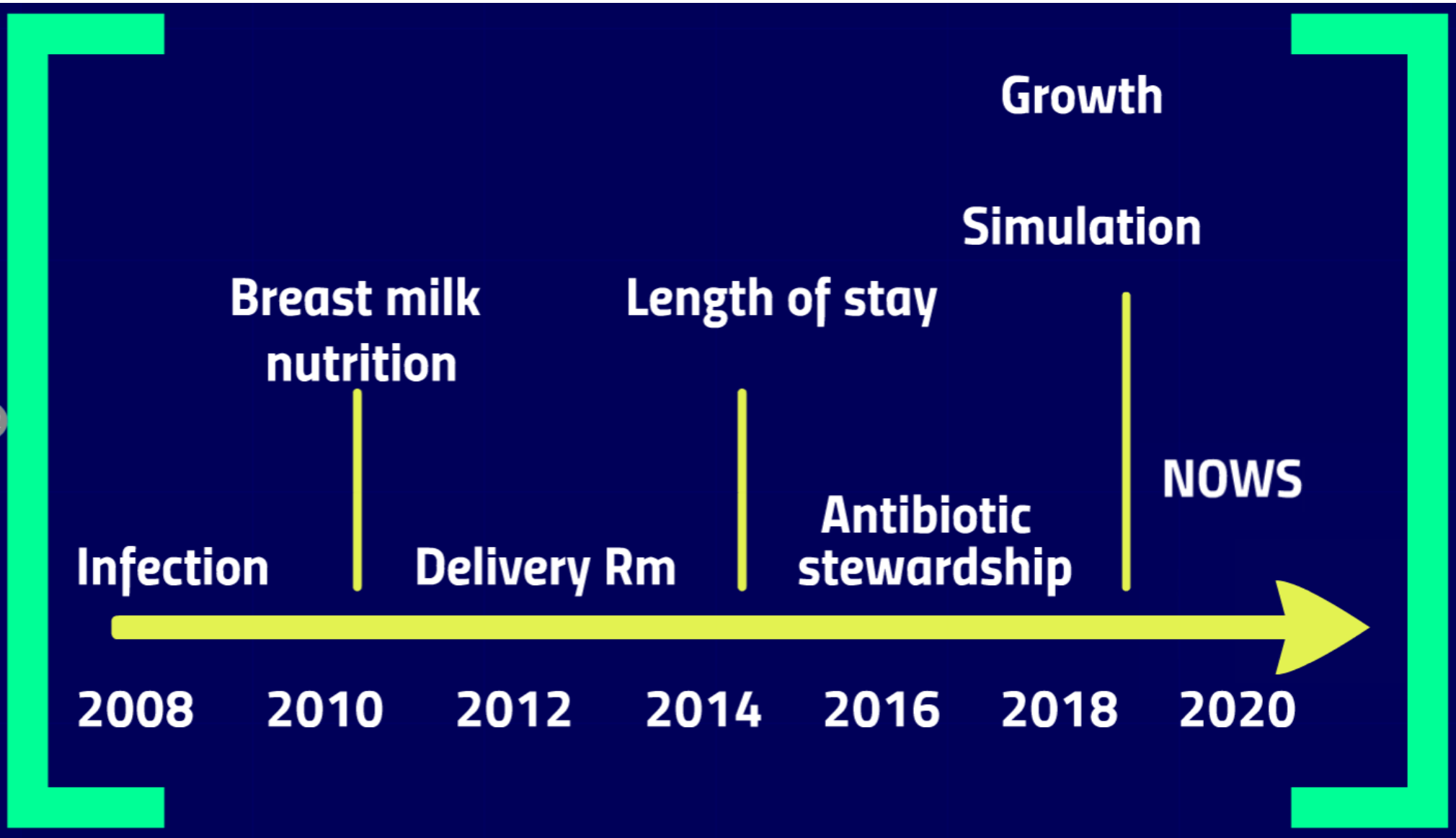
Date: Mar 5, 2021, 8:00am to 4:00pm

Location: Virtual

REGISTER »

Friday, March 5, 2021

2021 CPQCC Improvement Palooza

Advancing Anti-Racism in the NICU Through Teamwork and Family Centeredness

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QI INFRASTRUCTURE SUBCOMMITTEE ---

Growth

Simulation

Breast milk nutrition

Length of stay

Infection

Delivery Rm

Antibiotic stewardship

NOWS

2008   2010   2012   2014   2016   2018   2020

Collaborative QI

IHI Model for Improvement

Delivery Room Management

Richard Bell, MD, Neil Finer, MD, Louis Halamek, MD, Tina Leone, MD, Courtney Nisbet, RN, MS, Guadalupe Padilla, MD, Janet Pettit, RN, MS, NNP, Christine Retta, RN, MS, NNP, Richard Topel, MD, David. Wirtschafter, MD

on behalf of the Perinatal Quality Improvement Panel (PQIP), California Perinatal Quality Care Collaborative (CPQCC)

4. **Maintain normal infant temperature: (Primary Author: Tina Leone, MD)**

Maintain normal core body temperature (i.e. 36.5-37.5°C) by considering and utilizing a variety of techniques:

Quality Improvement Toolkit

California Perinatal Quality Care Collaborative

2007-2008: Toolkits disseminated through in-person regional meetings and webinars

RISKS →────────────────────────→ OUTCOMES

Need for <u>resuscitation</u>

Low admission temperature
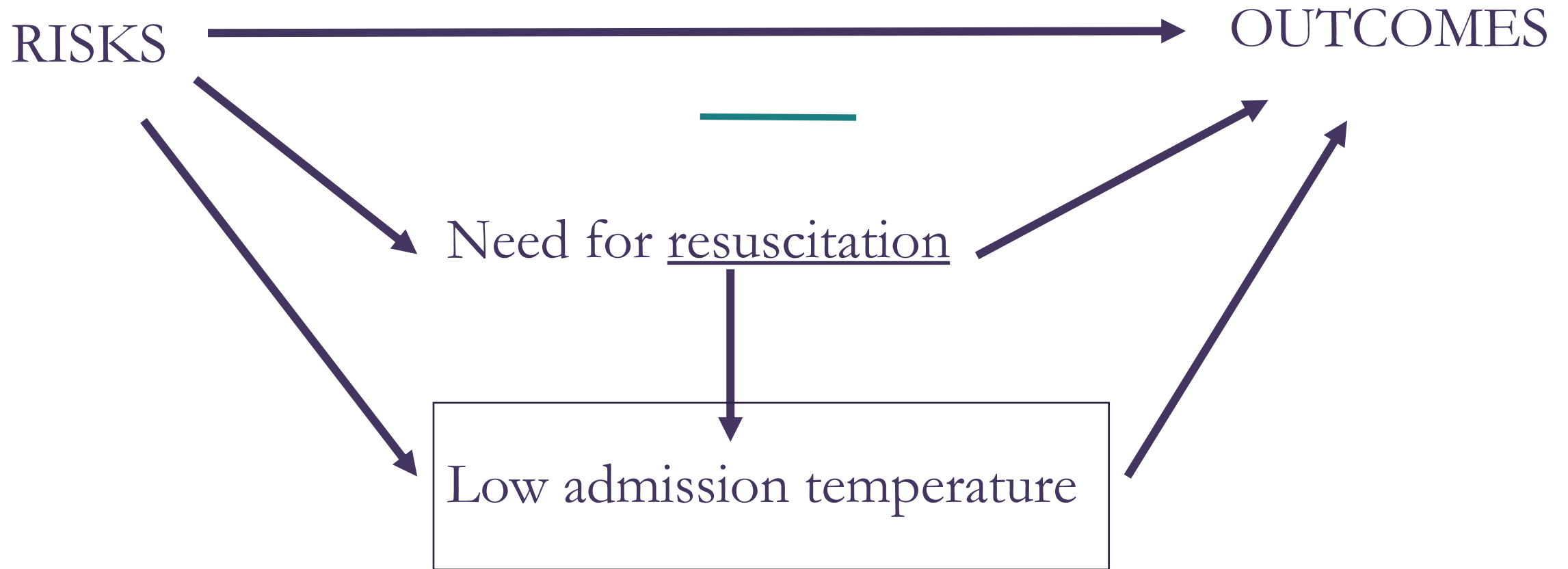
More resuscitation → less attention to thermal management
Effective resuscitation → improved outcomes
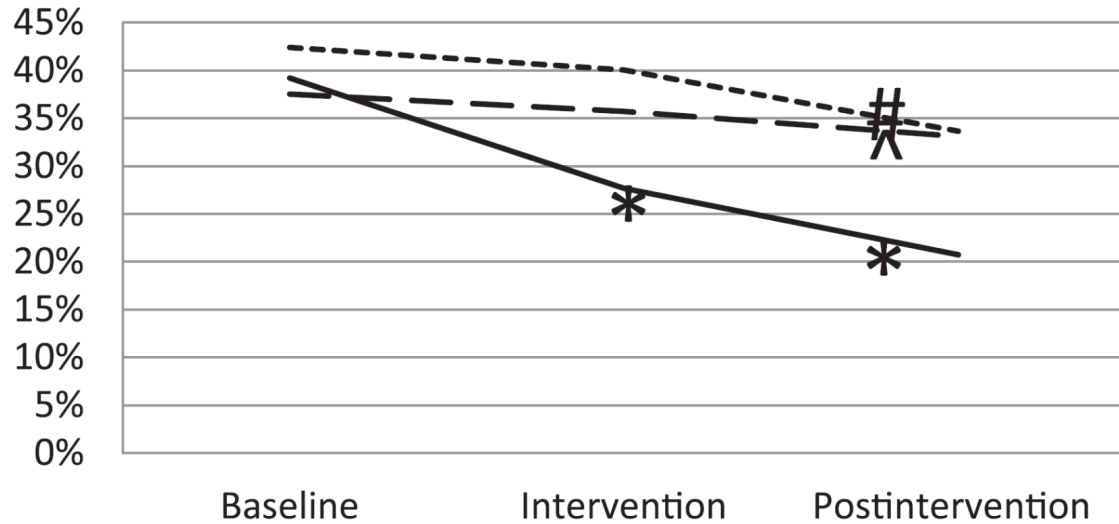
Delivery Room Management Collaborative

2011-2012

Focus on the VLBW infant

- AVOID hypothermia

- ESTABLISH lung volume in least invasive manner

- SUPPORT teamwork with checklists, briefings, and debriefings

3 groups for comparison

Baseline – intervention – sustainability periods

- COLLABORATIVE QI – 20 hospitals – participated together in IHI style collaborative, in-person learning sessions, monthly webinars, listserv, data sharing and reporting

- NICU QI – 31 hospitals – initial training, local QI team, data infrastructure for following processes and outcomes, no infrastructure for collaboration with other NICUs

- NON-participants – 44 hospitals – access to toolkit

A % Hypothermia

B % Hyperthermia

—— Collaborative   – – NICU QI   ·····Nonparticipants
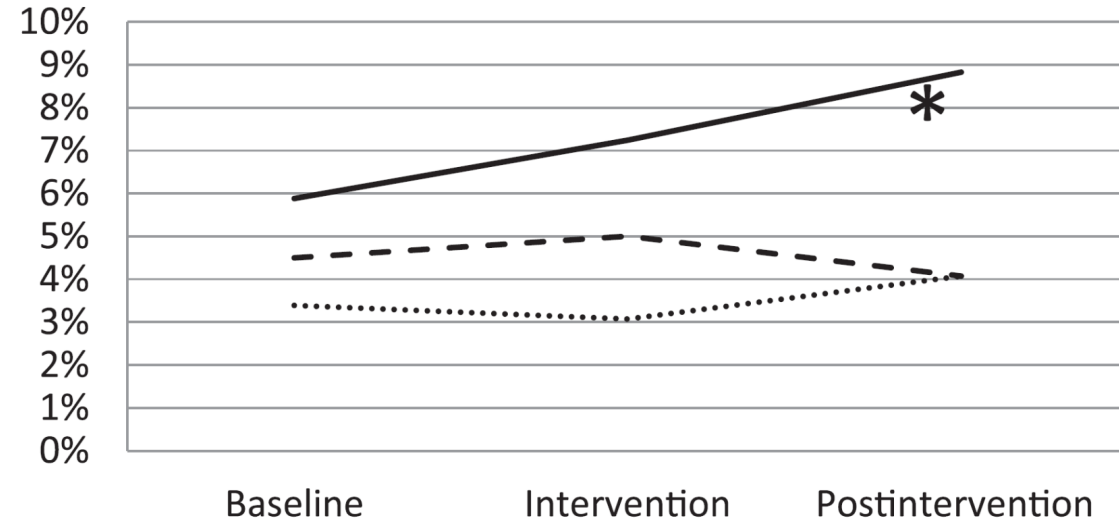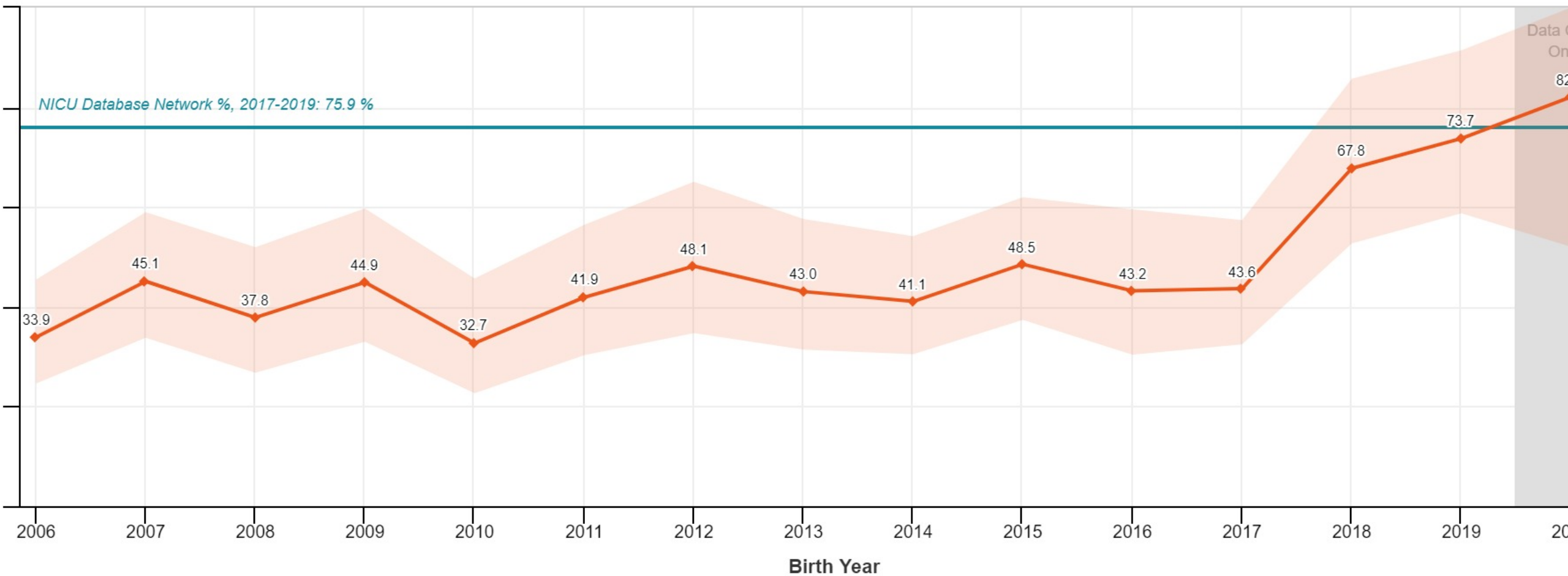
Lee et al. Implementation Methods for Delivery Room Management: A Quality Improvement Comparison Study. Pediatrics. 2014;134(5):e1378

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Normothermic Infants (Body Temperature within 1 hour of NICU admission 36.5 to 37.5&degC)

Inborn Infants 401 to 1,500 grams or 22 to 31 weeks of Gestation Born in 2006-2021

Legend: LPCH at Stanford · NICU Database Network · Regional NICUs · Mid-coastal · Children's

NICU Database Network %, 2017-2019: 75.9 %

Data points (LPCH at Stanford):
- 2006: 33.9
- 2007: 45.1
- 2008: 37.8
- 2009: 44.9
- 2010: 32.7
- 2011: 41.9
- 2012: 48.1
- 2013: 43.0
- 2014: 41.1
- 2015: 48.5
- 2016: 43.2
- 2017: 43.6
- 2018: 67.8
- 2019: 73.7
- 2020: 82

Birth Year

Normothermic Infants (Body Temperature within 1 hour of NICU admission 36.5 to 37.5&degC)
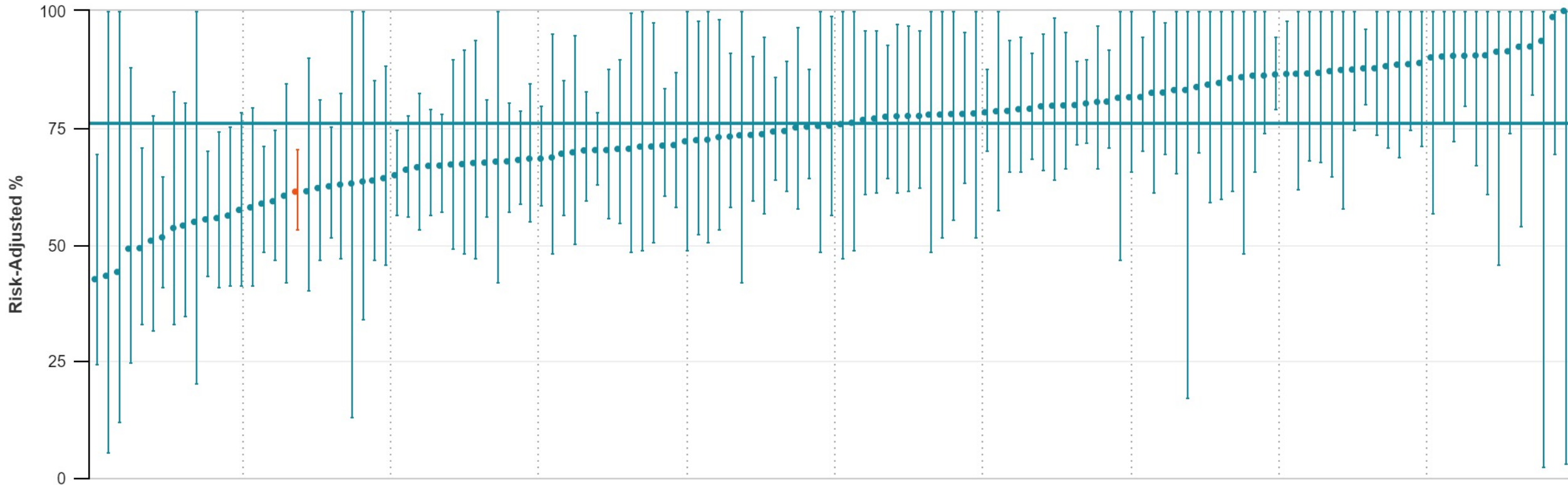
Inborn Infants 401 to 1,500 grams or 22 to 31 weeks of Gestation Born in 2006-2021
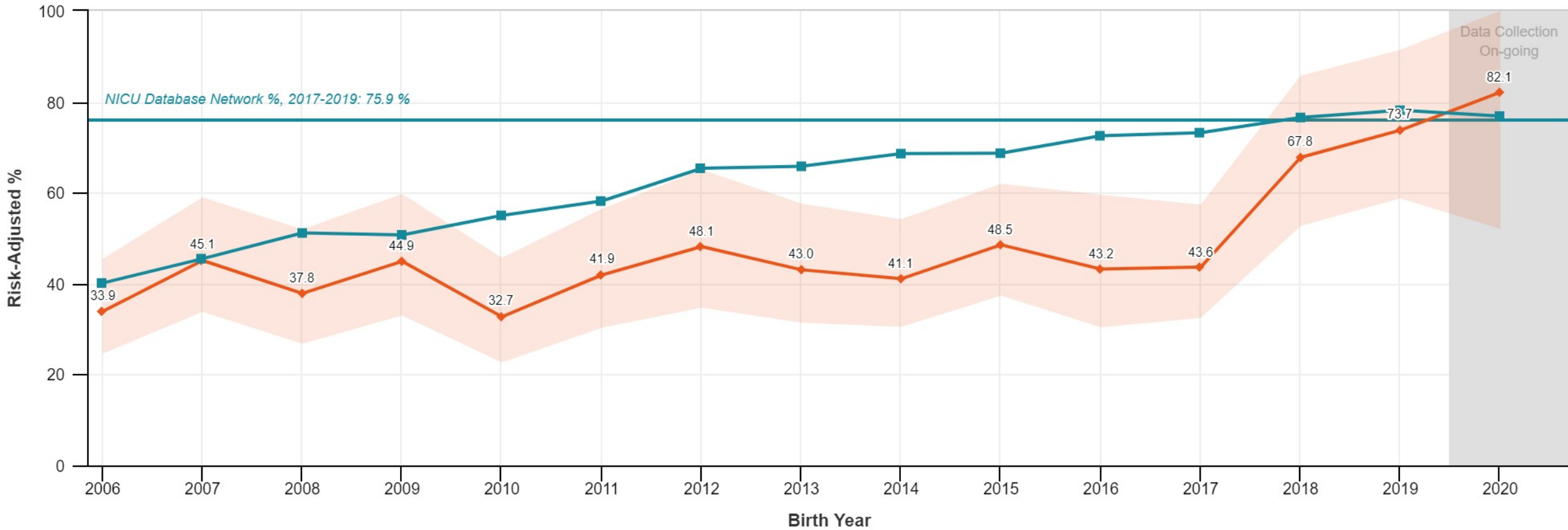
2017-2019

Inborn Infants 401 to 1,500 grams or 22 to 31 weeks of Gestation Born in 2017-2019

— NICU Database Network 2017-2019: 75.9%   — Regional NICUs 2017-2019: 72.2%   — Mid-coastal 2017-2019: 67.4%   -- Children's 2017-2019: 70.9%
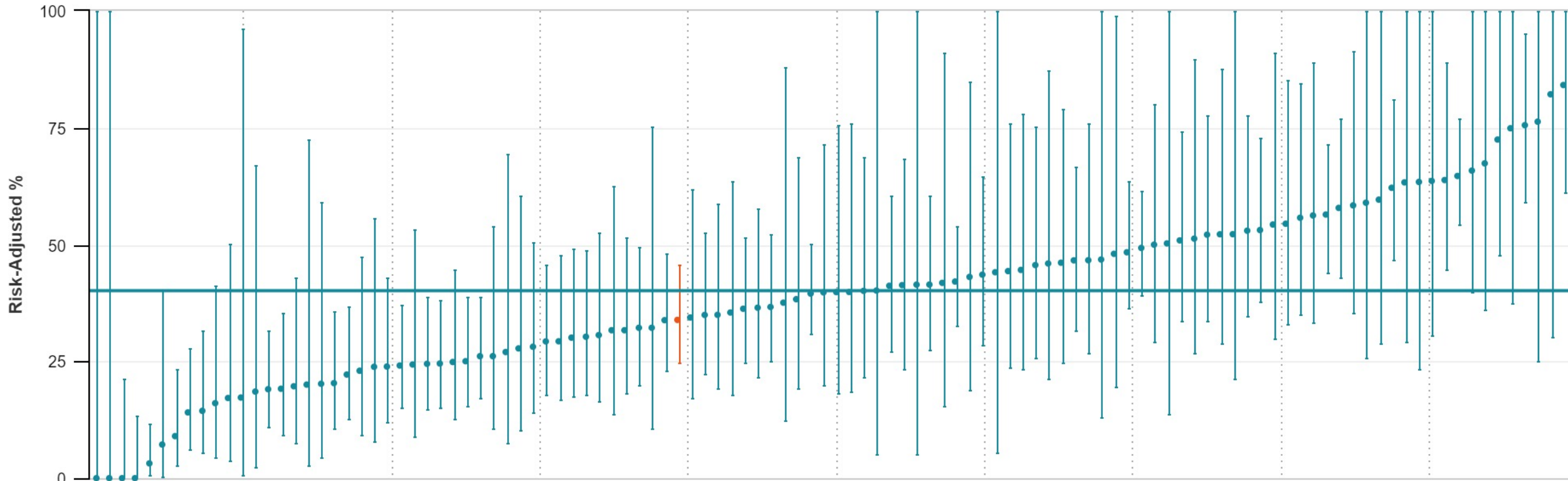
NICU Database Member NICUs in Ascending Order by %
LPCH at Stanford highlighted.

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2006

Inborn Infants 401 to 1,500 grams or 22 to 31 weeks of Gestation Born in 2006

— NICU Database Network 2017-2019: 40.1%   — Regional NICUs 2017-2019: 38.6%   — Mid-coastal 2017-2019: 38.5%   - - Children's 2017-2019: 40.4%

Risk-Adjusted %

NICU Database Member NICUs in Ascending Order by %
LPCH at Stanford highlighted.

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ELBW infants <1000 grams in 2019 - CPQCC

Temperature Celsius (C)	N (%)	Mortality
<20 (Errors)	**1 (0.1)**	**100% (1/1)**
32-32.9	**1 (0.1)**	**100% (1/1)**
33-33.9	**1 (0.1)**	**100% (1/1)**
34-34.9	**5 (0.4)**	**40% (2/5)**
35-35.9	**42 (2.9)**	**29% (12/42)**
36-36.4	215 (15.1)	21% (46/215)
36.5-37.5	1089 (76.3)	14% (154/1089)
37.6-37.9	45 (3.2)	4% (2/45)
38.0 and above	29 (2.0)	14% (4/29)
Total	1428	16% (223/1428)

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infants 1000 to < 1500 grams in 2019

Temperature Celsius (C)	N (%)	Mortality
<20 (Errors)	0	0
32-32.9	0	0
33-33.9	0	0
34-34.9	2 (0.1)	0
35-35.9	46 (2.0)	4% (2/46)
36-36.4	324 (13.7)	4% (14/324)
36.5-37.5	1835 (77.9)	2% (35/1835)
37.6-37.9	103 (4.4)	0
38.0 and above	47 (2.0)	4% (2/47)
Total	2357	2% (53/2357)

Updated 1/22/21

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High performance unit

OPEN ACCESS

Perinatal quality improvement bundle to decrease hypothermia in extremely low birthweight infants with birth weight less than 1000 g: single-center experience over 6 years

Dilip R Bhatt,[1] Nirupa Reddy,[1] Reynaldo Ruiz,[2] Darla V Bustos,[3] Torria Peacock,[1] Roman-Angelo Dizon,[1] Sunjeeve Weerasinghe,[1] David X Braun,[1] Rangasamy Ramanathan [4]

- Journal of Investigative Medicine 2020

- **Kaiser Fontana Medical Center**

Thermoregulation bundle:

- **Target ELBW infants**

- **Dedicated delivery room / operating room with temperature 24/7 at 74°F.**

- **Exothermic mattress, radiant warmer 100% heat, cap, warm towels**

High performance unit

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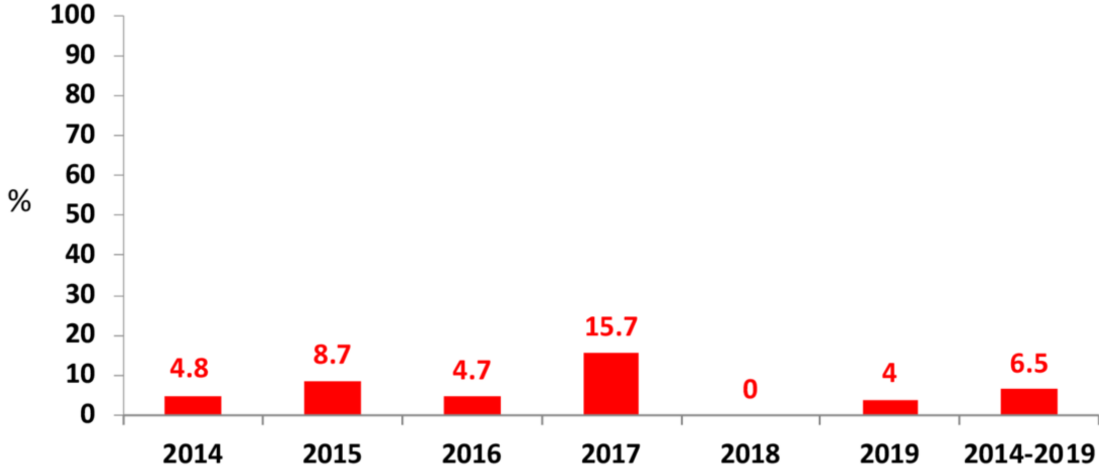
Figure 2   Per cent hyperthermia (>37.5°C) in extremely low birthweight infants by year.

200 ELBW infants from 2014 to 2019 – 182/200 (91%) normothermic

5 – mildly hypothermic (36.0-36.4)

13 – hyperthermic

ZERO - < 36.0

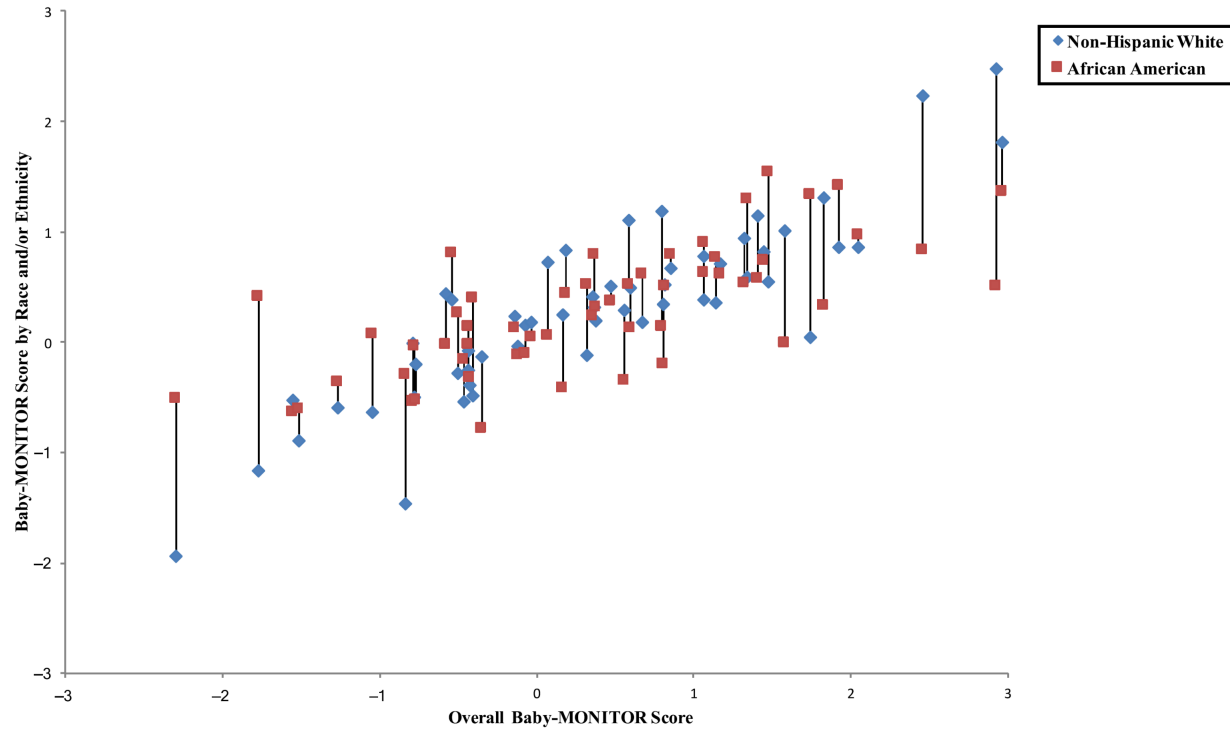# Baby-MONITOR composite quality of care measure

FIGURE 5
Baby-MONITOR scores for each NICU by race and/or ethnicity. NICUs with at least 10 infants in each race are shown in the graphs. Race- and/or ethnicity-specific Baby-MONITOR scores standardized against all infants are used (y-axis). The overall composite score (not race- and/or ethnicity-adjusted) is used on x-axis. The correlations with the overall Baby-MONITOR score are as follows: white = 0.88; African American = 0.70; Hispanic = 0.89; Asian American = 0.69; all $P < .0001$. Overall and white versus African American ($n = 53$).
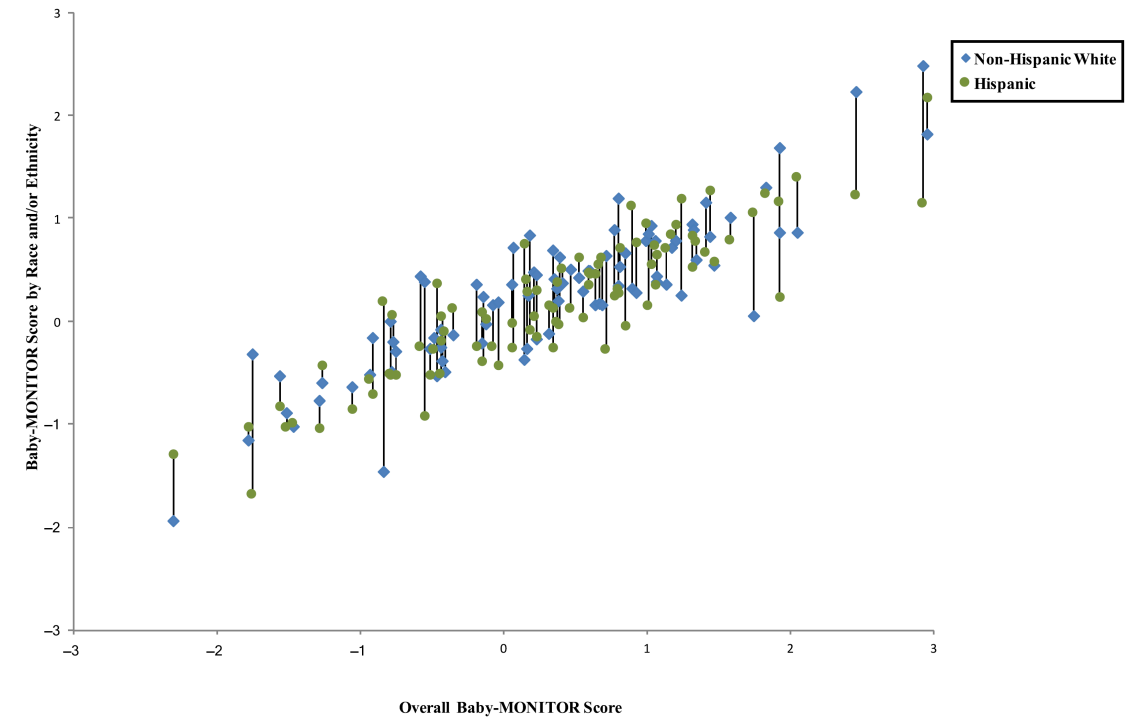
FIGURE 6
Baby-MONITOR scores for each NICU by race and/or ethnicity. NICUs with at least 10 infants in each race are shown in the graphs. Race- and/or ethnicity-specific Baby-MONITOR scores standardized against all infants are used (y-axis). The overall composite score (not race- and/or ethnicity-adjusted) is used on x-axis. The correlations with the overall Baby-MONITOR score are as follows: white = 0.88; African American = 0.70; Hispanic = 0.89; Asian American = 0.69; all $P < .0001$. Overall and white versus Hispanic ($n = 88$).

Profit et al. Racial/Ethnic Disparity in NICU Quality of Care Delivery. Pediatrics 2018;140(3)

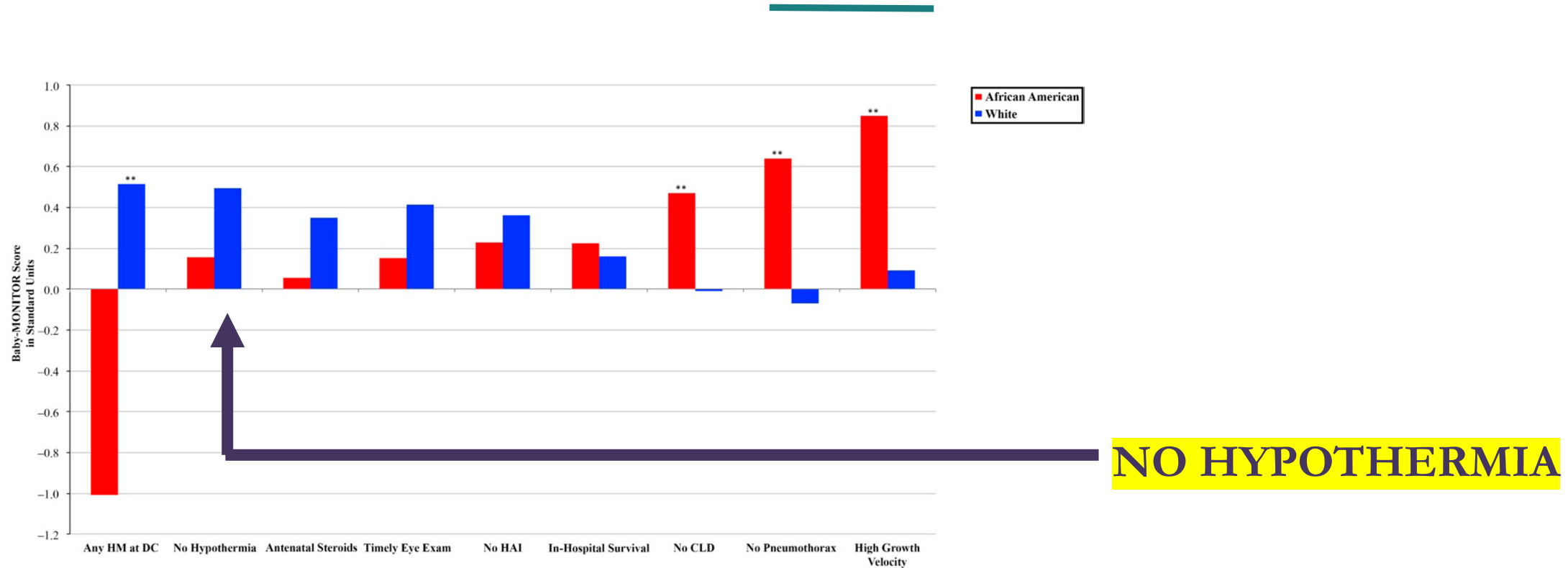# Baby-MONITOR composite quality of care measure

FIGURE 3
Baby-MONITOR subcomponent score by race and/or ethnicity. Each subcomponent is listed on the x-axis; standardized observed minus expected z scores are shown on the y-axis. Scores >0 indicate better than expected performance. Comparison of African American and white infants. HM, human milk. ** P < .05, * P < .1.

Profit et al. Racial/Ethnic Disparity in NICU Quality of Care Delivery. Pediatrics 2018;140(3)
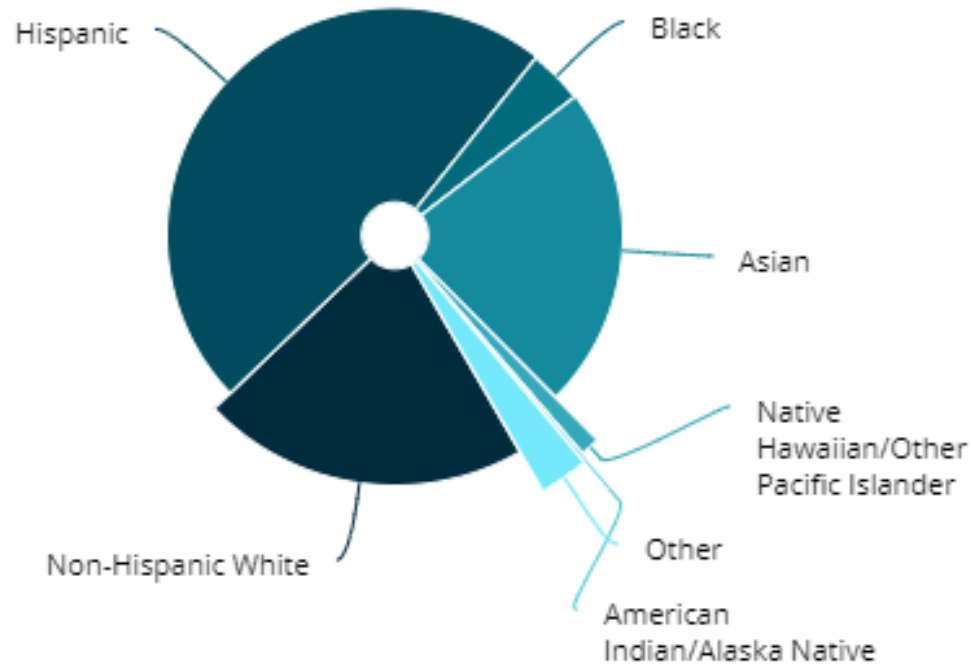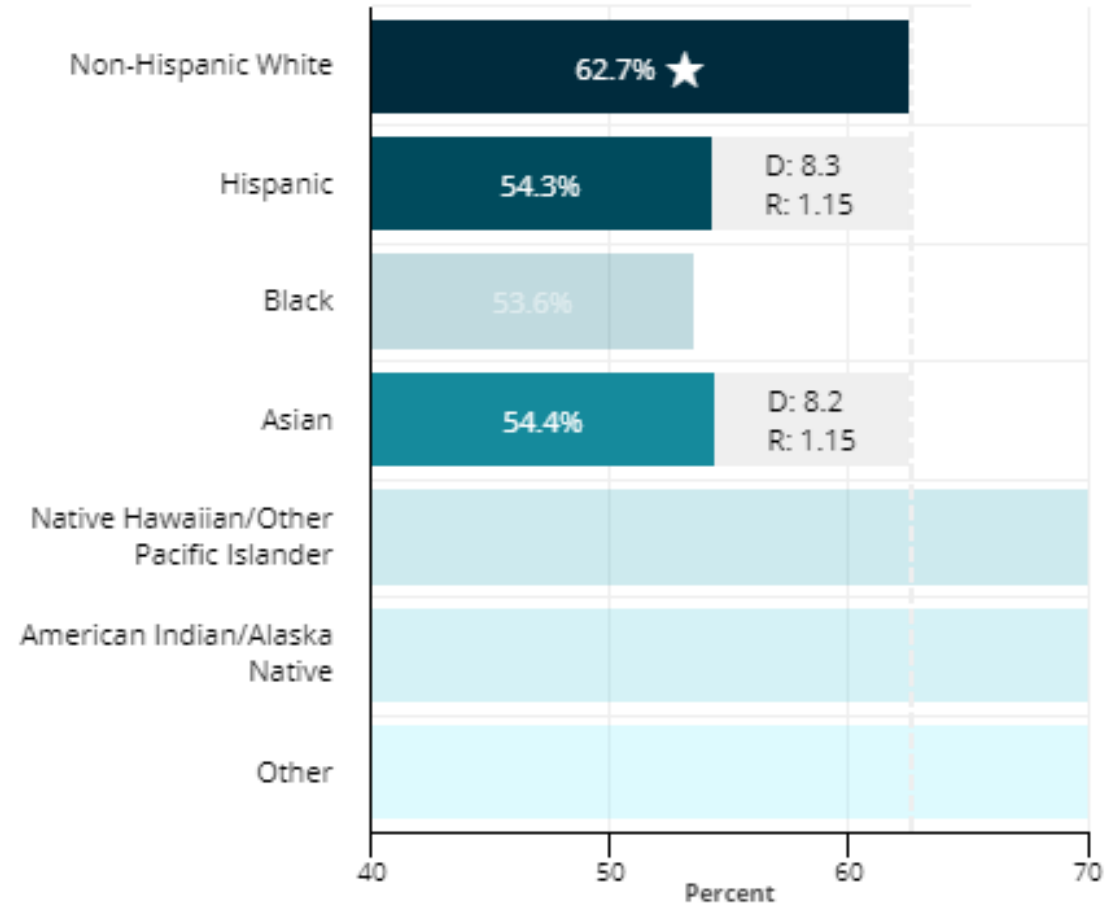
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Delivery Room Management

Quality Improvement Toolkit

California Perinatal Quality Care Collaborative

About   NICU   Analysis   Improvement   Follow-Up   Engage

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